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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

ENTROPIC COMMUNICATIONS, LLC,

Plaintiff,

v.

DISH NETWORK CORPORATION, *et al.*,

Defendants.

ENTROPIC COMMUNICATIONS, LLC,

Plaintiff,

v.

COX COMMUNICATIONS, INC., *et al.*,

Defendants.

Case No.: 2:23-cv-01043-JWH-KES (Lead Case)
Case No.: 2:23-cv-01047-JWH-KES (Related Case)
Case No.: 2:23-cv-01048-JWH-KES (Related Case)
Case No.: 2:23-cv-05253-JWH-KES (Member Case)

ENTROPIC'S SUPPLEMENTAL BRIEF REGARDING DIRECTV'S REQUEST FOR JOINDER

ENTROPIC COMMUNICATIONS, LLC,

Plaintiff,

v.

COMCAST CORPORATION, *et al.*,

Defendants.

ENTROPIC COMMUNICATIONS, LLC,

Plaintiff,

v.

DIRECTV, LLC, *et al.*,

Defendants.

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Plaintiff Entropic Communication LLC's ("Entropic") well-plead allegations in its First Amended Complaint against DirecTV (Dkt. 168 ("FAC")) confirm that U.S. Patent Nos. 9,838,213 ("the '213 Patent") and 10,432,422 ("the '422 Patent") are patentable. Entropic plead facts to show that, prior to the inventions of the '213 and '422 Patents, there were technological challenges to managing bandwidth in a point-to-point network where devices compete over shared resources. (FAC, ¶¶ 138–143.) Entropic also plead how the '213 and 422 Patents recite technological solutions to these challenges by reciting specific functionality that was neither routine nor conventional: a network coordinator node ("NC node") that allocates and aggregates guaranteed (or "parameterized") quality of service ("QoS") flows for other nodes in the network. (*Id.*, ¶¶ 143, 154–157, 161–163, 170–173, 177–179.)

Entropic's allegations were not before the Court when Defendant Cox Communications, Inc. ("Cox") moved to dismiss the '213 and '422 Patents as directed to ineligible subject matter. (Dkt. 64 ("Cox Motion").) These allegations materially change the eligibility analysis and, at present, preclude DirecTV from joining in the Cox Motion. To resolve Cox's Motion and DirecTV's joinder request, Entropic proposes to amend its pleadings against Cox to assert the same facts about the prior art and the patents as it did against DirecTV. DirecTV could then join in the Cox Motion, which should be denied based on Entropic's well-plead allegations.

I. ENTROPIC'S ALLEGATIONS CONFIRM THAT THE '213 PATENT RECITES PATENTABLE SUBJECT MATTER

Entropic Inc. "revolutionized the delivery of highspeed data networking services to customers on existing home coaxial infrastructure." (FAC, ¶ 135.) But this revolution created a new challenge: how to ensure reliable data transmission in a point-to-point network with competing bandwidth demands. (*Id.*, ¶¶ 136–137.) As Entropic alleges, the '213 Patent recites a specific technological solution to this problem by enabling an NC node to set guaranteed QoS flows. (*Id.*, ¶¶ 151, 157, 159.) These allegations demonstrate why Cox's Motion should be denied.

a. The '213 Patent Recites an Improvement to Networking Technology.

As plead in Entropic's FAC, demands for bandwidth in existing point-to-point networks caused performance problems because "applications have to compete for the same limited bandwidth" and a "high-throughput download" could "cause the degradation of other more important applications sharing the network." (Dkt. 168-15 ("'213 Pat."), 1:63–2:3; FAC, ¶¶ 138–139.) The point-to-point architecture posed technological barriers to solving this problem because network conditions were dynamic and there was no "pre-defined" network manager. ('213 Pat., 1:55–62; FAC, ¶¶ 23, 141–142.) Entropic's allegations show that the '213 Patent "purports to meet a challenge unique to computer networks" and is thus patentable. *Packet Intel. LLC v. NetScout Sys., Inc.*, 965 F.3d 1299, 1309 (Fed. Cir. 2020).

The claims recite a point-to-point network by reciting the flow of traffic "from a source node to at least one egress node," rather than through an intermediary such as an access point. ('213 Pat., cl. 1, Fig. 5.) To address the lack of a pre-defined manager in that network, claim 1 recites a method performed by an "NC node." (*Id.*) As Entropic alleges, an NC node is understood in the art and in the context of the patents as a node that can change based on network conditions and is not pre-defined. (FAC, ¶ 142; '213 Pat., 1:55–62.) This NC node performs several functions that were not performed in prior art point-to-point networks: (1) broadcasting a request for a guaranteed QoS flow (FAC, ¶ 161); (2) determining whether available network resources can support the guaranteed QoS flow between a source and egress node (*id.*, ¶ 162); and (3) allocating resources to support the flow, or else determining the maximum data rate that could be supported (*id.*, ¶ 163). By establishing a guaranteed QoS flow based on network resources, the NC node can overcome technical problems with latency and performance degradation for time-sensitive applications like video streaming. (*Id.*, ¶¶ 157, 164; '213 Pat., 1:63–2:3, 20:46–64.)

The '213 Patent recites a technological solution to a networking problem, just like the claim in *Packet Intel*. The claim in *Packet Intel*. addressed a shortcoming in

the art by identifying disjointed connection flows. 965 F.3d at 1309–10. Similarly, the claims of the '213 Patent address a shortcoming with prior networks by employing an NC to identify resources and establish guaranteed QoS flows. (FAC, ¶¶ 151, 152, 157.) Because the specifically recited functions of the NC node "improv[e] the functionality of computers and computer networks themselves," the claims of the '213 Patent are distinguishable from the claims in the *Electric Power* case, which merely "us[ed] computers as tools to solve a power grid problem." *See SRI Int'l, Inc. v. Cisco Sys., Inc.*, 930 F.3d 1295, 1304 (Fed. Cir. 2019) (citing *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016)).

Cox's own authority recognizes this distinction. In *OpenTV, Inc. v. Netflix Inc.*, the defendant argued that a claim was invalid as directed to the abstract idea of ensuring that resources were available before permitting transmission. 76 F. Supp. 3d 886, 890–92 (N.D. Cal. 2014), cited at Dkt. 64-1 ("Cox Mem.") at 22. The *OpenTV* Court rejected this argument because the claim, although facially broad, "appears to be directed at providing a technological solution" rather than "merely attempting to claim a computer-based implementation of a long-established concept or practice." 76 F. Supp. 3d at 891. The same is true here: Entropic's allegations demonstrate that the claimed invention of the '213 Patent is directed to improving bandwidth allocation in point-to-point networks, rather than attempting to claim a long-standing practice using networks as mere tools. (FAC, ¶¶ 138–143, 151–152.)

Entropic's allegations materially undermine the eligibility analysis in Cox's Motion. First, Cox wrongly reads out the requirement that the steps be performed by an NC node. (Cox Mem. at 20.) Performing these steps by the NC node—as opposed to a source node, egress node, or a dedicated controller—is a critical aspect of the invention. (*E.g.*, FAC, ¶¶ 152, 154–156.) The lack of a dedicated controller creates problems for network management in point-to-point networks sharing bandwidth. ('213 Pat., 1:55–62.) The NC is key to that solution because it allocates time slots for all nodes, even though the identity of the node fulfilling that role can change based

on network conditions. (*Id.*, 1:55–62, 4:2–8, cl. 4.; FAC, ¶ 151.) These time slots are "the most basic bandwidth requirement for a pQoS flow." ('213 Pat., 19:16–22.) By implementing the method in an NC node, the invention enables parameterized QoS flows "within existing in-home networks" without adding costly dedicated network controllers or requiring complex configuration menus. (*Id.*, 2:4–12, 3:50–65.)

Second, Cox is wrong to argue that the '213 Patent fails to recite "how" it solves a technological problem. (Cox Mem. at 22.) Claims need not recite every detail of how an invention works to be patentable. (*See* Entropic Hr'g Demonstrative at 9–14 (collecting Federal Circuit cases finding claims patentable despite lack of detail), Dkt. 282-1.) Nor do claims need to "articulate the advantages of the claimed combinations to be eligible." *Uniloc USA, Inc. v. LG Elecs. USA, Inc.*, 957 F.3d 1303, 1309 (Fed. Cir. 2020). This is why claims must be read in light of the specification, which can provide "important details on the technological problem and how the claimed invention solves that problem." *Mentone Sols. LLC v. Digi Int'l Inc.*, Nos. 2021-1202, 2021-1203, 2021 WL 5291802, at *4 (Fed. Cir. Nov. 15, 2021). In any case, claim 1 does recite how it solves a technological problem. As Entropic alleges, point-to-point networks suffered from degradation because nodes competed over shared resources without a dedicated device to control traffic. (FAC, ¶¶ 139–142; '213 Pat., 1:63–2:7.) The claim recites the steps an NC node must perform to determine the resources available for a guaranteed QoS flow between a source and egress node, and to allocate resources if the flow can be supported. ('213 Pat., cl. 1.) As a result, flows that are sensitive to degradation, such as video streams, can be guaranteed bandwidth as compared to flows "for which there is no required or predictable bandwidth," such as file transfers. (*Id.*, 1:65–2:3, 20:46–21:17.)

Third, Entropic's FAC shows that Cox oversimplifies the claims by ignoring the claimed "guaranteed quality of service flow" and the determination of whether the network can "support" a guaranteed QoS flow. (Cox Mem. at 20–23.) As Entropic's FAC explains, this element is integral to the invention because it newly

enables a point-to-point network to guarantee resources for a specified flow. (FAC, ¶¶ 142, 143, 152, 154, 155.) Further, these limitations are tied to specific teachings in the specification about how to solve the technical problems faced by the inventors. Namely, "support" is determined by the NC using "Aggregated TPS" (a measure of time slots per second), "Aggregated PPS" (a measure of packets per second), and "capacity" of the source and egress nodes. ('213 Pat., 27:44–56, Table 10.)

Lastly, Entropic's allegations show that claims 4 through 7 are independently patentable. Claim 4 specifies a coaxial network where the NC node schedules all traffic. ('213 Pat., cl. 4.) Entropic plead that this specific environment lacked a way to allocate bandwidth (FAC, ¶¶ 137–140) and how establishing guaranteed QoS flows using an NC node overcomes those shortcomings (FAC, ¶¶ 151–157, 159, 164). Claims 5, 6, and 7 recite further specificity about using "cost" and "peak data rate" to determine if a flow can be admitted to the network, which the specification ties to specific actions used to solve problems with bandwidth allocation. ('213 Pat., 17:54–18:32 ("Cost of a Flow (CF) is a measure of the specific bandwidth required to support a given pQoS flow . . . "), 20:36–64 ("pQoS flow guarantee means that the pQoS-enabled network is able to support the flow provided that the CF does not exceed the available network bandwidth").) Claims 5, 6, and 7 thus recite an even more specific solution to the latency problem plead by Entropic. (FAC, ¶ 139).

b. The '213 Patent Recites Inventive NC Node Functionality.

Even if the '213 Patent were found to be directed to an abstract idea, Entropic plead facts to show that the '213 Patent recites an inventive concept: using an NC to allocate network resources for guaranteed QoS flows. These facts—which are not currently of record in the Cox case—establish that the claimed invention is "different from and improves upon the prior art" and thus recites an inventive concept. *Coop. Ent., Inc. v. Kollective Tech., Inc.*, 50 F.4th 127, 132–33 (Fed. Cir. 2022).

As Entropic alleges, specifying an NC node to set parameterized QoS flows in a point-to-point network was neither routine nor conventional. (FAC, ¶¶ 159–163.)

The Federal Circuit has previously found an inventive concept in claims that "carve out a specific location" for performing key network functions. *Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1352 (Fed. Cir. 2016). In *Bascom*, the claimed invention recited a method for filtering content using "generic computer, network and Internet components." *Id.* at 1349. Nevertheless, the Federal Circuit held the claims recited an inventive concept in "the installation of a filtering tool at a specific location" (a remote ISP server) that provided benefits to network management. *Id.* at 1350. The same is true here: querying and allocating resources at an NC node is an inventive concept because it recites functionality at a specific location that improves bandwidth management in a point-to-point network without the need for a dedicated network controller. (FAC, ¶¶ 138–142, 152, 157, 164.)

A second inventive concept is the determination, by the NC, of a "maximum data rate that would have resulted in a successful request" when a request is "denied based on bandwidth-related reasons." ('213 Pat., cl. 1.) The claimed invention relates to creating or updating parameterized QoS ("PQoS") flows in a network, which maps to the "creation" and "update" transactions described in the specification (*id.*, 23:1–31:20). When the claim refers to "bandwidth-related reasons" for denying the creation or updating of a flow, it is referring to the "bandwidth-related criteria" that must be met before the NC node will permit the creation of a new QoS flow. (*Id.*, 27:44–55.) Each criterion requires the NC node to perform specific tasks not done in the art, such as calculating "remaining node capacity." (*Id.*, 19:1–64.) This determination of a maximum bandwidth for a PQoS flow was "not a routine or well-known activity," (FAC, ¶ 164), and the specification confirms this with "important details" on how the invention works. *Mentone*, 2021 WL 5291802, at *4.

Cox misses the point when it argues that the NC node is "generic and conventional computer equipment." (Dkt. 69 ("Cox Reply") at 9.) The fact that any node can serve in the NC role does not make the functions of the "NC node" generic; it makes them *fluid*. This fluidity presents a technological challenge because the

"coordinating" node is not fixed. (*See* '213 Pat., 1:51–62.) The claimed method overcomes this challenge with flexibility, giving new functionality to the NC rather than adding a dedicated manager. (*See id.*, 2:4–7.) Entropic plead that using an NC node to allocate parameterized QoS flows is not conventional, and it plead facts about the state of the art of point-to-point networks to bolster those allegations. (FAC, ¶¶ 138–139, 154–156, 161–163.) These allegations are consistent with the '213 Patent, which distinguishes its invention from using a "high-level network controller" to "set[] priority to data packets or data streams within the network." ('213 Pat., 2:4–7.)

Entropic's allegations also rebut Cox's argument that the '213 Patent "monopolize[s] the concept of requesting and receiving information from nodes in a network" for allocating resources. (Cox Mem. at 22.) Entropic's allegations explain the challenges faced in the prior art with bandwidth management. (FAC, ¶¶ 138–142.) The '213 Patent does not claim every way to address these challenges and thus "do[es] not preempt the use of" allocating resources in a network. *Bascom*, 827 F.3d at 1352. Instead, it recites a specific solution: (1) use an NC; (2) to query at least a source node and egress node; (3) about resources to support a requested parameterized QoS flow; and (4) to allocate resources for the parameterized QoS flow, or else determine the maximum data rate that could be supported. ('213 Pat., cl. 1.) Any method that does not use an NC or parameterized QoS is unclaimed.

In sum, Entropic plead specific technological problems (FAC, ¶¶ 135–142) and how the use of an NC node to guarantee QoS flows was an unconventional solution to those problems (*id.*, ¶¶ 151–157, 159, 164). These allegations must be taken as true and suffice to deny Cox's Motion. *Kollective*, 50 F.4th at 132–33.

II. ENTROPIC'S ALLEGATIONS CONFIRM THAT THE '422 PATENT RECITES PATENTABLE SUBJECT MATTER

As Entropic has plead, there was a need in the art to ensure reliable data transmission in a point-to-point network with competing bandwidth demands. (FAC, ¶¶ 136–137.) The '422 Patent recites a technological solution to this problem by

enabling a requesting node (such as a new node entering the network) to query and obtain, via an NC node, a list of all PQoS flows on the network. (*Id.*, ¶¶ 167, 169, 173, 175, 180.) By routing queries through the NC node, the '422 Patent recites a specific method that enables nodes in a point-to-point network to obtain the status of all PQoS flows in the network. (*Id.*, ¶¶ 169–172, 177–179.)

a. The '422 Patent Recites an Improvement to Networking Technology.

As Entropic alleges, point-to-point networks posed technological barriers to bandwidth management because network conditions were dynamic and there was no "pre-defined" network manager. (Dkt. 168-17 ("'422 Pat."), 1:60–67; FAC, ¶¶ 23, 141–142.) And because traffic in such a network does not pass through a single device (such as an access point), no one device could track PQoS flows on its own. (*See* '422 Pat., 4:8–14, 16:38–42, Figs. 1 and 5.) Thus, as Entropic alleges, there was no pre-existing way for a node to ascertain the status of PQoS flows allocated across the entire network. (FAC, ¶¶ 141–142.) Entropic's allegations show that the '422 Patent claims an improvement to network functionality and thus "purports to meet a challenge unique to computer networks." *Packet Intel.*, 965 F.3d at 1309.

The claimed invention improves network management by reciting a specific way for a node to learn, via the NC, of the PQoS flows already present in the network. (FAC, ¶¶ 167, 178, 179.) As Entropic alleges, claim 1 of the '422 Patent is directed to "evaluating the existing guaranteed quality of service flows in a logical point-to-point network." (*Id.*, ¶ 167.) This allegation is consistent with the '422 Patent, which explains that a node can "obtain information about the availability of bandwidth for asynchronous stream traffic" and use it to adjust how it sends data. ('422 Pat., 21:2–10 ("If the prioritized bandwidth is not available due to heavy network loading . . . the source (ingress node 508) may then attempt to send the traffic as asynchronous data traffic.").) Claim 1 leverages the NC node—as opposed to a dedicated controller—to aggregate PQoS flow data for the network, and thus recites a specific improvement in network functionality. *Packet Intel.*, 965 F.3d at 1309–10.

The '422 Patent's aggregation of data about PQoS flows is a patentable improvement under Federal Circuit precedent. In *SRI Int'l*, the Federal Circuit analyzed a claim that recited the use of network monitors for "detecting . . . suspicious network activity based on analysis of network traffic data," "generating . . . reports of said suspicious activity," and "automatically receiving and integrating the reports of suspicious activity." 930 F.3d at 1301 (internal citation omitted); (*see* Entropic Hr'g Demonstrative at 14). The Federal Circuit held that this claim was directed to "an improvement in computer network technology"—even though the claim itself did not specify how to generate, receive, or integrate the reports. *SRI Int'l*, 930 F.3d at 1303. The claimed invention of the '422 Patent is similarly patentable: it aggregates data about PQoS flows in an NC-managed network, enabling nodes to obtain complete information about guaranteed PQoS flows in a network without the requesting node itself needing to query every other node and without requiring new hardware. ('422 Pat., 32:54–67.) This is an improvement to point-to-point networks, which previously did not aggregate PQoS flows through an NC. (FAC, ¶¶ 141–142.)

Further, Cox is wrong to argue that the '422 Patent was required to recite how nodes can use the aggregated list of PQoS flows of the invention to improve network efficiency. (Cox Mem. at 11–12.) The '422 Patent "is directed to improving the functionality of one tool [aggregation of PQoS flow data] that is part of an existing system [point-to-point networks]" and thus need not "recite how that tool is applied in the overall system [e.g., using aggregated PQoS flow data to manage traffic] in order to constitute a technological improvement that is patent-eligible." *Koninklijke KPN N.V. v. Gemalto M2M GmbH*, 942 F.3d 1143, 1151 (Fed. Cir. 2019). As Entropic plead, the '422 Patent enables nodes to "evaluat[e] the existing guaranteed quality of service flows" and thus improves part of an existing system. (FAC, ¶ 167.)

b. The '422 Patent Recites Inventive NC Node Functionality.

Even if the '422 Patent were found to be directed to an abstract idea, Entropic's FAC shows that the '422 Patent recites an inventive concept: aggregating, via an NC,

the PQoS flows used throughout a point-to-point network. As Entropic alleges, point-to-point networks in the art did not maintain or aggregate PQoS flows. (FAC, ¶¶ 138–139.) These networks also lacked a dedicated controller that could track PQoS flows in the network. (*Id.*, ¶¶ 141–142.) Alternative solutions, such as a dedicated "high-level network controller" or "complex configuration menus," were inadequate and inappropriate for the dynamic point-to-point architecture that the '422 Patent sought to improve. ('422 Pat., 2:9–18, 3:61–4:5; FAC, ¶¶ 143, 170–172, 176–180.)

Claim 1 of the '422 Patent recites an inventive concept by specifying the use of an NC node to aggregate PQoS flow data. Claim 1 does not generically recite requesting data; it requires the request to go to the NC node, which in turn solicits PQoS data from each individual ingress node and aggregates that data in response. ('422 Pat., cl. 1.) By channeling requests through a "specific location"—the NC node—the invention aggregates QoS flow data across the point-to-point network without the need for a dedicated controller and without requiring each node to broadcast requests to all other nodes. *See Bascom*, 827 F.3d at 1350. This specific use of an NC node—together with Entropic's allegations about technical problems in the prior art, (FAC, ¶¶ 139–142)—is sufficient to recite an inventive concept.

So, too, does the '422 Patent recite an inventive concept in the ordered combination of steps. Claim 1 requires the request for a list of PQoS flow data to be received by the NC node, which triggers the NC to request from other nodes a specified range of PQoS flows. ('422 Pat., cl. 1.) The NC node then aggregates the results and returns the list to at least the requesting node. (*Id.*) As Entropic alleges, the specific steps taken by the NC to perform this aggregation were neither routine nor conventional in the art. (FAC, ¶¶ 177–179.) These allegations are consistent with the '422 Patent, which explains how the invention gives nodes a new ability to evaluate guaranteed QoS flows and modify transmissions accordingly. ('422 Pat., 20:59–21:10.) Thus, Entropic has plead facts to show that the claimed invention is "different from and improves upon the prior art." *Kollective*, 50 F.4th at 132.

Dated: February 2, 2024

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CERTIFICATE OF COMPLIANCE

The undersigned, counsel of record for Plaintiff Entropic Communications, LLC, certifies that this brief contains 10 pages of substantive argument, which complies with the page limit set by court order dated January 17, 2024.

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